What is claimed is:

1. A method for assessing the status of work waiting for service, comprising:

providing a work queue having a plurality of work items;

generating, based at least in part on said work queue, an ordered set of items related to the plurality of work items in the work queue; and

analyzing said ordered set to predict a future state of said work queue.

2. The method of Claim 1, further comprising:

determining a required queue position (RQP) for each work item in said work queue, said RQP based on a service time goal for each work item and a weighted advance time of the work queue.

3. The method of Claim 2, wherein said generating step includes:

creating an array of counters, each element in said array of counters corresponding to a predefined range of required queue positions.

4. The method of Claim 3, wherein said generating step further includes:

incrementing a counter in said array of counters associated with the RQP for each work item.

5. The method of Claim 2, wherein said determining step includes:

for each work item, subtracting an amount of time since said work item was received from the service time goal for said work item to obtain a remaining time for said work item.

6. The method of Claim 5, wherein said determining a required queue position step includes:

determining said weighted advance time of the work queue; and

for each work item, dividing said remaining time by said weighted advance time for the work queue.

7. The method of Claim 1, wherein said generating step further comprises:

determining a range of required queue positions which correspond to each item within said ordered set; and

incrementing a counter associated with the item within the ordered set which corresponds to a required queue position associated with each work item.

8. The method of Claim 7, wherein said predefined range of queue positions for each item in said ordered set is one.

9. The method of Claim 7, wherein said predefined range of queue positions for each item in said ordered set, where the number of the item is N, is $2^{N-1} < RQP \geq 2^{N}$.

10. The method of Claim 1, wherein said analyzing step comprises:

creating an index variable;

setting the index variable to one;

creating a sum variable;

setting said sum variable to zero;

calculating a new sum as the sum of the previous value of the sum variable and the value of the item in the ordered set which corresponds to the index variable;

determining a highest required queue position (RQP) associated with the item in the ordered set which corresponds to the index variable;

determining if the sum is greater than said highest RQP;

setting a state to "Future Risk" when said sum is greater than said highest RQP; and

incrementing said index and repeating said calculating a new sum, determining a highest RQP, determining if the sum is greater than the highest RQP, and setting a state steps when said sum is not greater than said highest RQP.

11. The method of Claim 10, wherein said analyzing step further comprises:

determining if there are additional items in said ordered set; and

setting a state to "On Target" when there are no additional items in said ordered set.

12. The method of Claim 10, wherein said analyzing step further comprises:

when said sum is greater than said highest RQP, predicting a time of said "Future Risk".

13. The method of Claim 12 wherein said time is calculated as the product of the index and the weighted advance time for the work queue.

14. The method of Claim 10, wherein said analyzing step further comprises:

when said sum is greater than said highest RQP, determining an extent of the "Future Risk".

15. The method of Claim 14, wherein said extent is calculated as the difference between said sum and said highest RQP.

16. A computer readable medium containing instructions for performing the steps of Claim 1.

17. A logic circuit operable to perform the steps of Claim 1.

18. A computational component for performing a method, the method comprising:

determining a required queue position (RQP) for each of a plurality of work items, said RQP based on a remaining time for the work item and a weighted advance time for servicing of said work items;

incrementing a counter in an element of an array of counters, said element corresponding to a predefined range of required queue positions; and

analyzing said array of counters to predict a future state of said work items.

19. The computational component of Claim 18, wherein said determining a required queue position step includes:

for each work item, subtracting an amount of time since said work item was received from a service time goal for said work item to obtain a remaining time for said work item.

20. The computational component of Claim 19, wherein said determining a required queue position step includes:

determining said weighted advance time for servicing of work items for said work items; and

for each work item, dividing said remaining time by said weighted advance time for servicing of work items.

21. The computational component of Claim 18, wherein said incrementing a counter step comprises:

determining a range of required queue positions which correspond to each element within said array of counters; and

incrementing a counter associated with the element within the array of counters which corresponds to the required queue position obtained in said determining a required queue position step.

22. The computational component of Claim 18, wherein said predefined range of queue positions for each element in the array of counters is one.

23. The computational component of Claim 18, wherein said predefined range of queue positions for each element in the array of counters, where the number of the element is N, is $2^{N-1} < RQP \geq 2^N$.

24. The computational component of Claim 18, wherein said analyzing step comprises:

creating an index variable;

setting said index variable to one;

creating a sum variable;

setting said sum variable to zero;

calculating a new sum as the sum of the value of the sum variable and the value of the counter in the element of the array of counters which corresponds to the index variable;

determining a highest RQP in said predefined range of RQPs in the element of the array of counters which correspond to the index variable;

determining if the sum is greater than said highest RQP;

setting a state to "Future Risk" when said sum is greater than said highest RQP; and

incrementing said index and repeating said calculating a new sum, determining a highest RQP, determining if the sum is greater than the highest RQP, and setting a state steps when said sum is not greater than said highest RQP.

25. The computational component of Claim 24, wherein said analyzing step further comprises:

determining if there are additional elements in said array of counters; and

setting a state to "On Target" when there are no additional elements in said array of counters.

26. The computational component of Claim 24, wherein said analyzing step further comprises:

when said sum is greater than said highest RQP, determining a time of said "Future Risk".

27. The computational component of Claim 26 wherein said time is calculated as the product of said highest RQP and the weighted advance time for servicing of work items.

28. The computational component of Claim 24, wherein said analyzing step further comprises:

when said sum is greater than said highest RQP, determining an extent of the "Future Risk".

29. The computational component of Claim 28, wherein said extent is calculated as the difference between said sum and said highest RQP.

30. A table maintained in an electronic memory of a contact center, comprising:

an identity of at least two work items; and

an ordered list having entries associated with a predefined range of required queue positions for said at least two work items.

31. The table of Claim 30, wherein:

said entries indicate required queue positions for said at least two work items.

32. The table of Claim 30, wherein:

said predefined range of required queue positions for each entry in said ordered list is one.

33. The method of Claim 30, wherein said predefined range of required queue positions for each entry in said ordered list, where the number of the entry is N, is $2^{N-1} < RQP \geq 2^{N}$.

34. A contact center for servicing a plurality of contacts received from a plurality of customers, comprising:

a plurality of workstations corresponding to a plurality of resources;

a central server in communication with the plurality of workstations, comprising:

at least one queue of contacts, each of said contacts having an associated service time goal; and

a workload monitoring agent operable to (a) monitor said at least one queue of contacts; (b) assess a state of said at least one queue of contacts with respect to the service time goals for said plurality of contacts; and (c) determine a number of contacts which are likely to not meet their service time goals and a time at which the service time goal for said number of contacts will expire.

35. The contact center of Claim 34, wherein the contacts in the at least one queue comprise one or more of realtime and non-real time contacts.

36. The contact center of Claim 34, wherein the workload monitoring agent is further operable to identify a weighted advance time for servicing of contacts and determine a required queue position for each of said contacts.

37. The contact center of Claim 36, wherein the workload monitoring agent determines said required queue position based on the weighted advance time for servicing of contacts, an elapsed time since the contact was received at said at least one queue, and a service time goal for the contact.

38. The contact center of Claim 36, wherein said required queue position is calculated as the difference between the service time goal and the elapsed time divided by the weighted advance time for servicing of contacts.

39. The contact center of Claim 34, wherein the contacts within the plurality of contacts have at least two service time goals.

40. The contact center of Claim 34, wherein the workload monitoring agent is further operable to determine, from the at least one queue, a representation of required queue positions associated with the contacts in said at least one queue.

41. The contact center of Claim 40, wherein a predetermined workload level exists when a queue position in the representation of required queue positions is less than a number of enqueued contacts ahead of the queue position in the representation of required queue positions.

42. The contact center of Claim 41, wherein the time at which the predetermined workload level will likely exist is the product of the weighted advance time for servicing of contacts and queue position at which the predetermined workload level will likely exist.

43. The contact center of Claim 42, wherein the number of contacts required to be serviced is the difference between the required queue position and the number of enqueued contacts before the required queue position.

ABSTRACT

The present invention provides a system and method for assessing the status of work waiting for service in a work queue or a work pool. Work items are placed in the work queue or work pool and have a service time goal. The work items in the work queue or work pool are scanned and a required queue position for each work item is calculated according to the amount of time remaining prior to the expiration of the service time goal and weighted advance time for servicing of work items in the work queue or pool. An array of counters has elements which correspond to required queue positions. Upon the calculation of the required queue position for a work item, the counter corresponding to the required queue position is incremented. When all of the work items are scanned, the array of counters is analyzed to predict a future state of the work queue or work pool.